

ALIGNING AN OPTICAL DEVICE SYSTEM WITH AN OPTICAL LENS SYSTEM

ABSTRACT

A scheme (systems and methods) for passively aligning one or more optical devices with a corresponding number of optical lenses in an accurate and efficient manner is described. By this approach, the invention avoids the often labor-intensive and costly steps required by conventional active alignment techniques that attempt to align the optical devices to the optical fibers. In one aspect, an optoelectronic device includes an optical device system, an optical lens system and a plurality of solder bumps disposed therebetween. The optical device system includes an optical device substrate supporting one or more optical devices and a solderable metallization pattern having a spatial arrangement with respect to the one or more optical devices. The optical lens system includes one or more optical lenses and a device bonding surface supporting a solderable metallization pattern having a spatial arrangement with respect to the one or more optical lenses. The solder bumps are disposed between the metallization patterns of the optical device system and the optical lens system. The plurality of solder bumps bond the optical device substrate to the device bonding surface with the one or more optical devices aligned with the one or more optical lenses. In another aspect, the optical lens system includes a spacer substrate defining one or more apertures therethrough. A method of aligning an optical device system and an optical lens system also is described.